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ENTOMOLOGICAL NEWS

DECEMBER 1947

Vol. LVIII No. 10

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ENTOMOLOGICAL NEWS

VOL. LVIII DECEMBER, 1947 No. 10

New Species of Trichoptera from the United States

By D. G. DENNING, University of Wyoming, Laramie

Recently the writer had the opportunity to examine several large collections of Caddis flies from Minnesota and southern United States. A number of undescribed species were encountered, nine of which are described herein. I would like to express my appreciation to Dr. H. R. Dodge, Dr. C. E. Mickel, and Dr. R. H. Daggy for collecting this material and making it available for study. Unless designated otherwise, holotypes are in the author's collection at the University of Wyoming.

Protoptila talola n. sp.

This species is closely related to *maculata* (Hagan) but can be distinguished from that species by the gradual, not abrupt, upturned apex of the lateral spines of the oedagus, by the mesad-directed instead of laterad-directed apices of the lateral spines, by the evenly rounded caudo-ventral corner of the oedagus and several other details of the male genitalia.

Male.—Length 4 mm. Spurs 0–4–4. Anterior margin of hind wing abruptly narrowed beyond hamuli. Color and general structure similar to *maculata,* but smaller in size. Male genitalia as in fig. 1. Sternite of sixth segment with an acute mesal projection reaching just beyond margin. Eight sternite produced into a long bifid process, apical incision shorter than in *maculata,* upturned only slightly distally. Tenth tergite with lateral arms directed ventro-caudad, apex nearly truncate, turned mesad but not sufficiently to enclose oedagus, a few setae dorsally; inner aspect as in fig. 1, apparent cerci ovate from lateral view, triangular from dorsal view. Lateral spines of oedagus short, sinuate from lateral view, attenuated distally and gradu-

ally curved dorsad; from dorsal aspect, fig. 1A, distal portion curved mesad, almost touching oedagus, a brush of minute caudad-curved setae along margin near apex. Oedagus with distal portion considerably enlarged, ventral margin rounded, caudo-ventral corner not produced beyond margin.

Holotype, male. Pine County, MINNESOTA, May 23, 1941, C. E. Mickel. Holotype deposited in the entomological collection of the University of Minnesota.

Protoptila georgiana n. sp.

This species bears some resemblance to *alexanderi* Ross but can readily be distinguished from that species and other described species of the genus by the tenth tergite, the lateral spines of the oedagus and the eighth sternite.

Male.—Length 3 mm. Spurs prominent, 0–4–4. Hind wings sabre-shaped, anterior margin abruptly narrowed beyond hamuli. Color and general structure typical for genus.

Male genitalia as in fig. 2. Sternite of sixth segment with a prominent mesal projection, fig. 2A. When viewed from dorsal aspect eighth tergite considerably flared laterally; apical margin heavily pigmented, slightly incised and bearing a few large setae. Eighth sternite produced into a long bifid process with apical incision wide, fig. 2B. Dorsad to the eighth sternite is a concave, deeply bifid plate-like process bearing a single seta at apex of each lateral lobe, best viewed from ventral aspect, fig. 2B. Tenth tergite divided into a pair of sclerotized structures projected caudad and gradually ventrad; apex of lateral lobe beak-shaped, turned slightly mesad but not quite enclosing oedagus, a few scattered setae along dorsal margin. Oedagus extending caudad beyond any other portion of genitalia, middle portion considerably narrowed, widened apically, slightly incised when viewed dorsally, caudo-ventral corner produced slightly beyond remainder; lateral spines of oedagus slender, arcuate, apex attenuated and bearing a few minute setae. Ventrad from base of oedagus arises a pair of slender setose lobes, directed caudo-ventrad. Ventrad and mesad to these lobes is a pair of structures bearing no setae and abruptly curved dorsad.

Holotype, male. Macon, GEORGIA, May 1944, H. R. Dodge.

Chimarra moselyi n. sp.

This species is related to *florida* Ross; it can be separated from that and other described species by the flat sinuate lateral processes of the tenth tergite, the slender rod-like structures associated with the oedagus and the wide prominent mesal process of the ninth sternite.

Male.—Length 5 mm. General color dark brown, legs pale yellowish with spurs darker, wings uniformly dark brown; antennae slightly darker than wings. Genitalia as in fig. 3. Tenth tergite, except lateral processes, semi-membranous, distal margin irregular; lateral sclerotized process extends caudad beyond remainder, twisted so that when viewed from dorsal aspect distal portion flattened, widened, rounded at apex; on dorsal surface are two short setae on an enlarged flattened tubercle; from base arises the prominent cercus. Claspers with base narrow, dorsal portion elongated into a clavate caudad directed process, apex quadrate when viewed dorsally; ventro-mesal portion from caudal view enlarged into a large triangular process, bearing several long setae along lateral margin (this margin and setae discernible from lateral view). Two pairs of sclerotized rods are associated with the oedagus: a ventral pair, long and slender, extending caudad beyond any other portion of genitalia, apex curved ventrad; a dorsal pair, heavily sclerotized, shorter than ventral pair, apex acute and slightly curved dorsad. Mesal process of ninth sternite very large and prominent.

Holotype, male. Macon, GEORGIA, July 1944, H. R. Dodge.

I take pleasure in naming this species in honor of Mr. Martin E. Mosely of the British Museum (Natural History), who has made so many noteworthy contributions to our knowledge of the Trichoptera.

Nyctiophlax celta n. sp.

This species is closely related to *vestitus* (Hagen); it can be distinguished from that species by the shape of the tenth tergite, the shape and size of the apical lobes of the clasper, the shape and size of the oedagus and the much narrower condition of the ninth sternite.

Male.—Length 5 mm. Wings light brown, antennae and legs yellowish. Wings with R_2 absent. General characteristics typical for genus. Male genitalia as in fig. 4. Tenth tergite lightly sclerotized, viewed from dorsal aspect apical margin with a distinct incision which forms a pair of short setiferous points. Cerci quadrate, extending caudad beyond tenth tergite, ventro-mesal portion projected ventro-caudad as a sclerotized process, its apex broadly rounded, not sub-acute as in *vestitus;* apical portion bearing several short stout setae. Claspers, seen from lateral aspect, with base rounded, gradually narrowed apically, apex with lateral lobe digitate, mesal lobe acute, not much longer than lateral lobe; seen from caudal view, fig. 4A, concave near base, apical portion widely and deeply incised; mesal lobe viewed from dorsal or caudal aspect quadrate apically. Oedagus somewhat tubular, apical portion enlarged and colored dark brown, apex bluntly rounded, no discernable dorsal rods present.

Holotype, male. Tallulah River, Tallulah Falls, GEORGIA, June 16, 1945, R. H. Daggy.

Cheumatopsyche wabasha n. sp.

Male.—Length 8 mm. Wing irrorate with brown and light tan. Head and thorax dark brown. The five basal segments of flagellum with a distinct dark brown V-mark.

Genitalia as in fig. 5. Tenth tergite somewhat wider than long, lateral lobes conspicuous, not extending dorsad to level of segment; seen from caudal view fig. 5A, lateral margin rounded, apical portion constricted, apices blunt and widely separated. Viewed from dorsal aspect apex of tenth tergite with a small incision; setae covering apical portion of lateral lobes quite long and curved caudad. Setiferous wart near base of tenth tergite lateral lobes elongate, irregular and bearing a number of setae. Basal segment of clasper narrow, gradually widened apically, apical segment tapering to a narrow apex, curved cephalad. Oedagus with basal portion only slightly enlarged, apical portion abruptly directed dorsad, lateral lobes short and ovate.

Holotype, male. Wabasha, MINNESOTA, July 19, 1941, Light trap, H. T. Peters. Holotype deposited in the entomological collection of the University of Minnesota.

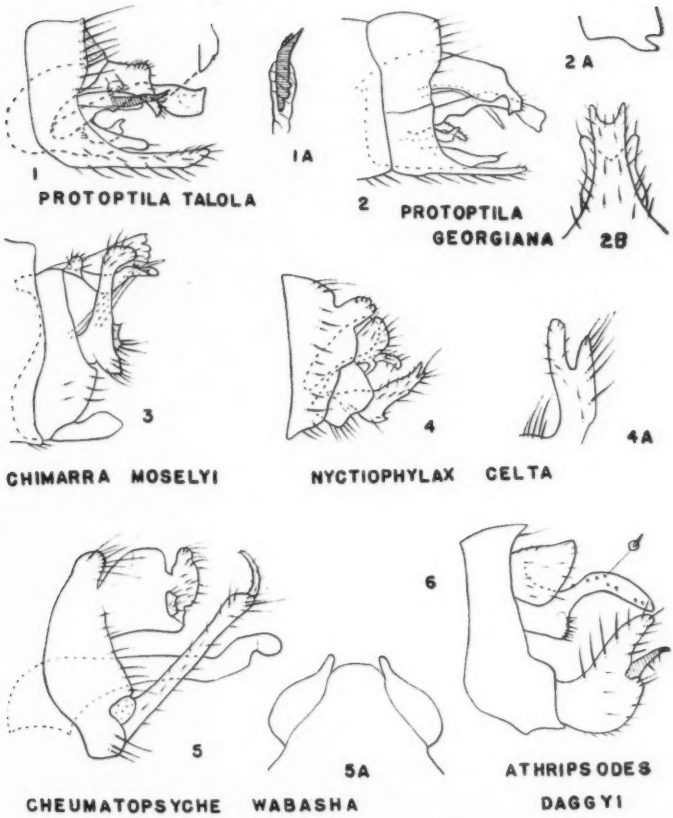

Fig. 1. *Protoptila talola,* male genitalia, lateral aspect; 1A, lateral spine of oedagus. Fig. 2. *Protoptila georgiana,* male genitalia, lateral aspect; 2A, sternite of sixth segment; 2B, sternite of eighth segment. Fig. 3. *Chimarra moselyi,* male genitalia, lateral aspect. Fig. 4. *Nyctiophylax celta,* male genitalia, lateral aspect; 4A, clasper, caudal view. Fig. 5. *Cheumatopsyche wabasha,* male genitalia, lateral aspect; 5A, tenth tergite, caudal view. Fig. 6. *Arthripsodes daggyi,* male genitalia, lateral aspect.

Athripsodes daggyi n. sp.

This species is closely related to *ophioderus* Ross, from which it differs in the shape of the tenth tergite, the much wider cerci, the wider basal portion of the clasper and the pair of stout straight dorsal spines of the oedagus.

Male.—Length 10 mm. Eyes small; general characteristics same as for genus. Color of head, body and appendages dark brown. Genitalia as in fig. 6. Tenth tergite long and narrow, as in *ophioderus* somewhat s-shaped when viewed laterally; basal portion large and wide, along ventro-distal corner a group of eleven short stout yellowish setae, dorsal surface bearing a pair of very short triangular protuberances; the dorsal surface of the apical portion bears a number of scattered minute stout spines; inner surface deeply excavated, viewed ventrally apical portion tapers gradually to a blunt point which is narrower than remainder. Cerci deeply incised dorsally, short and wide, ventro-caudal corner rounded, a few scattered setae over most of surface. Claspers with digitate lobe rather short, stout, bearing a considerable number of long setae; the heavily sclerotized spine acute distally, gradually curved mesad, bearing three short spines. Ventral spatulate plate of oedagus slightly longer than main structure; dorsal spines short, stout, heavily sclerotized and straight, apex acute.

Holotype, male. Flat Shoals, 5 miles south of Concord, GEORGIA, May 27, 1945, R. H. Daggy. *Paratype,* 2 males. Same data as for holotype.

Hydropsyche bidentata n. sp.

This species bears some resemblances to *betteni* Ross but differs markedly in the shape and incised apex of the oedagus, the vary short apical segment of the claspers, and the very irregular outline of the tenth tergite.

Male.—Length 10 mm. Genitalia as in fig. 7. Tenth tergite incised on meson almost one-half distance to base, apical dorsal corner with a sharp flat angulation, apical margin markedly declivous, truncate, very irregular; ventro-distal corner with a setiferous process which extends to the margin as a distinct,

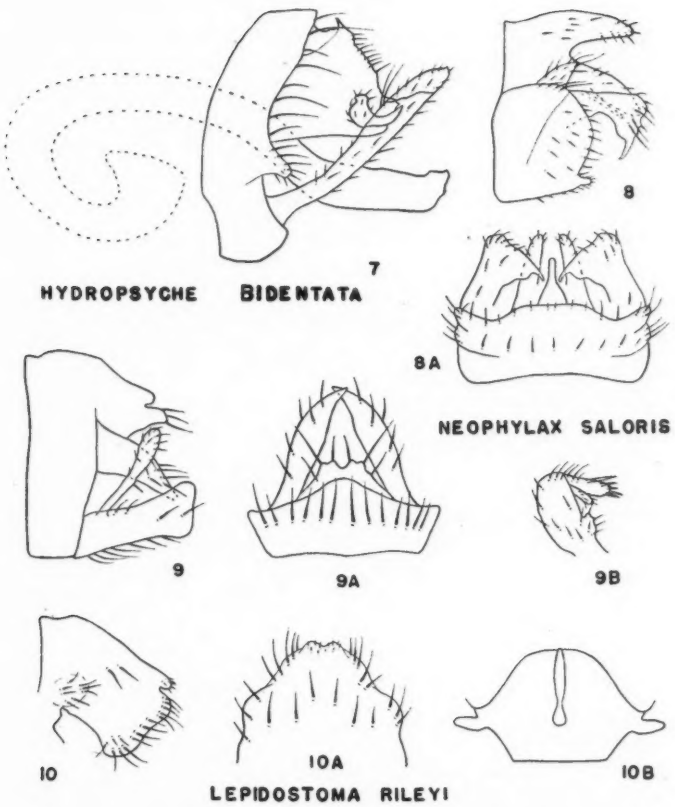

Fig. 7. *Hydropsyche bidentata,* male genitalia, lateral aspect. Fig. 8. *Neophylax saloris,* male genitalia, lateral aspect; 8A, tenth tergite, dorsal aspect. Fig. 9. *Lepidostoma rileyi,* male genitalia, lateral aspect; 9A, tenth tergite, dorsal aspect; 9B, clasper, ventral aspect. Fig. 10. *Lepidostoma rileyi,* female genitalia, lateral aspect; 10A, tenth tergite, dorsal aspect; 10B, spermatheca.

sharp, dorsad-directed tooth. Claspers with basal segment gradually widened toward apex; apical segment very short, acute apically and directed mesad. Oedagus cylindrical, long, basal portion does not quite form a complete circle, remainder extends gradually ventrad with the apical portion upturned to it; apex truncate except for a slight ovate lobe laterally, apico-dorsal portion flat and incised.

Holotype, male. Columbia, SOUTH CAROLINA, August 5, 1943, D. G. Denning. PARATYPE, male. Some data as for holotype.

Neophylax saloris n. sp.*

This species bears some resemblance to *nacatus* Denning but differs markedly from that and other described species in the long caudad-directed dorsal branch of the tenth tergite, the abruptly ventrad-directed clasper and the wide flattened mesal portion of the ninth sternite.

Male.—Length 10–10.5 mm. Head, body and appendages luteous. Wings irrorate light brown, apical portion of forewings considerably darker. Spurs brownish, inner spur of hind legs almost twice as long as outer spur, attenuated to a narrow apex. Sternite of seventh segment with an acute prominent mesal projection. Genitalia as in fig. 8. Tenth tergite with dorsal branch convex, directed caudad, seen from dorsal aspect incised one-half distance to base, forming a pair of slender digitate lobes bearing a few short setae apically; ventral branch directed ventrad, also deeply incised, both portions lying on each side of the slender attenuated oedagus, fig. 8A. Lateral portion of ninth segment with a triangular mesad-directed lobe, bearing several long setae. Claspers extend caudad as far as tenth tergite, apical portion directed ventrad into an acute apex, lateral margin nearly straight; viewed from ventral aspect claspers flattened, entire clasper curved mesad. Ninth sternite with apical margin produced into a wide flat projection.

Holotype, male. MACON, GEORGIA, November, 1943, H. R. Dodge. *Paratypes,* 3 males. Same data as for holotype.

* While this paper was in press this species was described as *Neophylax atlanta* by H. H. Ross (Trans. Amer. Ent. Soc. 73: 152. 1947). *N. saloris* is thus a synonym of *N. atlanta* Ross.

Lepidostoma rileyi n. sp.

Male.—Length 6.5 mm. Wings, body and appendages light brown. Wings without any unusual modifications. Maxillary palpi short, apparently one-segmented, held closely appressed to head and not extending beyond it. Antennal scape about as long as width of head. Genitalia as in fig. 9. Ninth segment approximately annulate, division between ninth and tenth tergites indistinct from lateral view. Seen from dorsal aspect tenth tergite divided into a pair of small irregular processes, each bearing several large setae, fig. 9A. Lobes of ninth segment directed gradually ventrad, acute distally, several scattered setae over dorsal surface; from dorsal aspect lobes are curved mesad so that apices overlap, fig. 9A. Claspers present a two-segmented appearance due to the distal portion being abruptly turned mesad and not discernible from lateral view; seen from lateral aspect, fig. 9, basal portion of clasper somewhat rectangular, and bearing near base a long slender dorsal process which is directed dorsad nearly to level of tenth tergite; seen from ventral aspect, fig. 9B, a small sub-triangular process is present along lateral margin, distal portion slender, elongate, apex rounded, lateral and apical margin bearing several large prominent flattened setae; where distal portion turns at a right angle from basal portion a slender digitate process arises on mesal surface.

Female.—Length 7 mm. Same general color and characteristics as male. Genitalia as in fig. 10. Viewed from dorsal aspect tenth tergite incised distally forming a pair of small protuberances bearing minute setae, fig. 10A. Viewed laterally, fig. 10, distal margin irregular with sides developed ventrad into a thin flange, quite heavily setose. Ventral groove of spermatheca, fig. 10B, occupying posterior two-thirds. Prominent lateral projections of spermatheca continue dorsad to form a large concave cephalad directed plate.

Holotype, male. Ela, North Carolina, May 30, 1941, S. S. Easter. *Allotype,* female.—Same data as holotype. *Paratypes,* 2 females.—Same data as holotype. Types deposited in the entomological collection of the University of Minnesota.

It is with pleasure that I name this new species in honor of Dr. W. A. Riley, retired head of the Division of Entomology, University of Minnesota.

A New Food Supply for Latrodectes mactans

By Mark Robinson, Springfield, Pennsylvania

The black widow spider is very common in southwest Philadelphia in an area which is used as an automobile graveyard and for dumping other refuse. By turning over an auto fender as many as five or six full grown female spiders can be found there in late summer or early autumn. In addition to their being so plentiful around the auto parts they can be found under pieces of paper, rocks, boards, and the ties of a railroad which runs through the site. In this one small area of about forty acres it was possible to collect two hundred adult female spiders in one afternoon.

The food of these spiders consists of ground beetles, wasps, flies and other insects that fly near the ground or have a habit of hiding under cover during the daylight. In recent years this area has become infested with the "Scarab" beetle *Autoserica castanea* which comes out to feed at night on almost all varieties of foliage or flowers.

In the daylight these beetles hide just under the soil or under boards, rocks, or pieces of paper or most anywhere in subdued light. The advent of these beetles to this area has been a boon to the black widows and most of their food during the season the adult beetles are present consists of these pests. Examination of the web and the ground under the web often reveals a score or two of husks of these beetles and at times a greater number can be found. On one occasion I counted seventy-eight husks of these beetles under or in the web of one adult female *Latrodectes mactans.*

The black widow spider has been condemned in a great many areas as a serious menace and it may be, but in some cases at least it is doing a good job in helping to control a pestiferous insect.

A Canthon with an Abnormal Tibia (Coleoptera)

By Mark Robinson, Springfield, Pennsylvania

A specimen of *Canthon nigricornis* Say in my collection from Goliad, Texas, collected by Hubbard and Schwartz has the anterior right tibia composed of three fairly normal tibiae grown together. Tibia number one is nearly normal in shape, except what should be the proximal end is unattached and what would normally be the anterior face is grown into what would normally be the anterior face of tibia number two. The end that would normally be the proximal end of tibia number two is also unattached. The end that would normally be the distal end of number two tibia is grown fast to the distal end of tibia number three. Only tibia number one has the normal number of teeth, both tibia number two and three have but two teeth. The outer edge of all three tibiae are crenate in the regular manner. The tarsus is attached to the distal end of tibia number one while the proximal end of tibia number three is attached to the femur. The spur is missing.

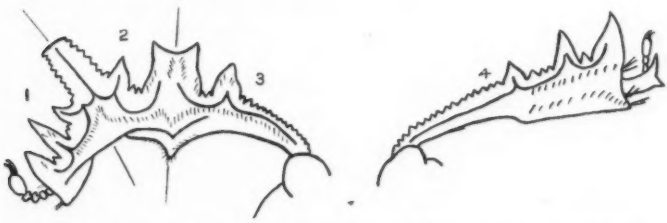

Fig. 1. Tibia number one of the abnormal tibia. 2. Tibia number two of the abnormal tibia. 3. Tibia number three of the abnormal tibia. 4. The left or normal tibia.

Length along the posterior face: Left or normal tibia—2.8 mm., right number one tibia—2.0 mm., right number two tibia—1.8 mm., right number three tibia—2.5 mm.

While occasional abnormalities are noticed as one studies large series of specimens, this is the most striking example to come to my attention and I know of no other such condition being previously recorded.

A New Geophiloid Centiped Taken at the Mexican Border

By RALPH V. CHAMBERLIN

The new centiped here described was taken at quarantine on the bridge at Eagle Pass, Texas. The type is in the author's collection.

APUNGUIS new genus

A genus of Schendylidae related to *Escaryus* in having the coxal pores numerous. It differs from *Escaryus* in having the claws of the second maxillae entirely smooth instead of pectinate and in not having the labrum free. Labrum arcuate, with numerous teeth. First maxillae with well developed membranous lappets on the palpi. Coxae of second maxillae united at the middle. Prehensors toothed within, exposed from above. Anal legs with well developed claws. Last coxae with numerous small pores.

Generotype.—*Apunguis prosoicus* new species

Apunguis prosoicus new species

Head without frontal suture; surpassed by the prehensors. The claws of prehensors armed at base with a small conical, black tooth; femuroid armed at distal end, the tooth paler; prosternum also armed with two minute teeth or denticles.

Spiracles all circular, the first considerably larger than the second.

Dorsal plates bisulcate.

Last ventral plate narrow, sides strongly converging caudad. Coxal pores small and numerous.

Pairs of legs, 43.

Length, about 16 mm.

Locality.—MEXICO. One female taken with fruit on the bridge at Eagle Pass, June 2, 1947.

Notes and News in Entomology

Under this heading we present, from time to time, notes, news, and comments. Contributions from readers are earnestly solicited and will be acknowledged when used.

Sterility in Insects: It is well known that interspecific crosses are almost always sterile. Usually no progeny are produced at all. Less commonly a hybrid generation is produced but is composed of sterile individuals. In only a few cases are fertile hybrids obtained.

Attempts to analyze the causes of sterility have not been more than partially successful. Cytogeneticists have presented good reasons to expect the failure of any except the closest of interspecific crosses. The failure of most "close crosses," however, is not well understood. Undoubtedly numerous factors enter in, even if we consider only those cases where copulation is readily obtained. General statements to the effect that more than a certain degree of genic unbalance is lethal, and that lesser degrees of unbalance may produce sterile individuals are reasonably well documented.[1] But one would like to know more of the mechanisms of how these disbalances operate.

The job of obtaining significant data on sterility has not been easy. Some cases of nutritional castration [2] and parasitic castration [3] have been partially elucidated but these do not answer questions about the nature of interspecific sterility. Stern [4] built up an intraspecific "sterility model" in *Drosophila melanogaster* but the artificiality of this case precludes its general applicability. Another intraspecific sterility case in *D. melanogaster* is the result of action of a mutant gene series called "lozenge." [5] This set of alleles affects the development of the female accessory reproductive ducts, and variation in the development of the reproductive organs coupled with the fate of

[1] Dobzhansky, T. Genetics and the Origin of Species. 1941.

[2] Pepper, J. H. and E. Hastings. Tech. Bull. 413, Montana Agric. Exp. Sta. 1943.

[3] Wigglesworth, V. B. The Principles of Insect Physiology. 1939.

[4] Stern, C. Amer. Nat., 70: 123–142. 1936.

[5] Oliver, C. P. and R. C. Anderson. Amer. Nat., 79: 89–94. 1945. Anderson, R. C. Genetics, 20: 280–296. 1945.

introduced sperm allows a partial analysis of the functioning of these structures. The dorsal spermatheca is necessary for high and extended fertility, whereas the presence or absence of the parovaria is of little significance; sperm are normally stored in the female in the ventral receptacle but remain viable only when the spermatheca is active. These data give us some good information about the physiology of the female reproductive tract; but it does not automatically follow that similar disturbances are involved in interspecific sterility. It would be helpful to know whether similar phenomena occur in partially fertile hybrids.

Recently a naturally occurring sterilizing mechanism has been found operative in many species of the genus *Drosophila*.[6] This has been termed the "insemination reaction." Examination of 35 species showed it normally present in 28 of these. It is likewise present but in exaggerated form in those cases where interspecific mating can be induced. In a normal intraspecific mating in a species showing this reaction, the addition of semen at copulation induces within a few minutes an enlargement of the vagina to 3–4 times the size in virgins. The enlargement is due to the secretion of fluid by the lining epithelium; an edematous, slightly opaque condition results. In these intraspecific matings the vagina returns to normal within a few hours. This recovery is correlated with the sperm leaving the vagina, either by entering the ventral receptacle where they are stored or (the remainder) being expelled. By ingenious use of sterile male hybrids of *D. arizonensis* x *D. mojavensis* which produce no sperm but do copulate and inject a sperm-free semen, it was possible to show that the insemination reaction is due to a substance, presumably protein, in the seminal fluid and not or not only to the sperm. This places the phenomenon in the general field of immunochemistry where known techniques should permit pushing the analysis further.

Concerning the absence of the insemination reaction in some species, a correlation was noted between the presence of a reac-

[6] Patterson, J. L. Proc. Natl. Acad. Sci., 32: 202–208. 1946. Univ. of Texas Publ.; no. 4720. 1947.

tion and the frequency of mating. Species which normally mate frequently (e.g. *D. melanogaster*) show no reaction; species which mate occasionally show a weak reaction, and species which normally mate only once show a strong reaction. Among common N. A. species the reaction is shown by *D. virilis* and *D. funebris*.

When an interspecific mating can be induced with a female of a species giving the insemination reaction, the same series of events take place except for the recovery phase. The sperm are usually inactivated or expelled, seldom do any enter the ventral receptacle, and the vagina becomes brownish or even black due to the reaction-mass containing the sperm. The mass may be expelled, but subsequently a sperm that was lucky enough to get into the ventral receptacle may function to fertilize an egg. Usually, however, there are no active sperm left for fertilization. Therefore, hybrids would not have a significant chance to become sufficiently numerous for establishment.

Obviously, this newly discovered isolating mechanism cannot answer all of the questions of interspecific sterility, and it remains to be seen whether or not comparable reactions will be found in other insect groups. However, this is a clear-cut and demonstrably effective mechanism *that occurs naturally*. As such it is a valuable new discovery in the field of interspecific sterility.

A. G. RICHARDS

Entomological Departments

In accordance with its policy of including news of interest to entomologists, ENTOMOLOGICAL NEWS is inaugurating a series of articles on entomological groups throughout the country that will be continued as material is received. The editorial board invites material similar to that given in this first note from universities and colleges, the Bureau of Entomology and Plant Quarantine, museums, the U. S. Public Health Service, entomological societies and any other official or semi-official groups of entomologists.

University of Minnesota

The Division of Entomology and Economic Zoology has undergone considerable change in recent years. Dr. Wm. A. Riley, medical entomologist and former chief, and Prof. A. G. Ruggles, economic entomologist and State Entomologist, have retired. Dr. M. C. Tanquary, apiculturist, died. Dr. Gustav Swanson, economic zoologist, and Dr. H. H. Shepard, insecticide specialist, have resigned to accept positions elsewhere. The above losses, not all at the same time, left Dr. C. E. Mickel in taxonomy, Dr. A. A. Granovsky in economic entomology and insect vectors of plant diseases, Dr. A. C. Hodson in ecology, and Dr. M. H. Haydak in apiculture.

Dr. Mickel became Chief of the Division in 1944. In 1945, Dr. W. H. Marshall (formerly with the U. S. Fish & Wildlife Service) was brought in for economic vertebrate zoology; Dr. A. G. Richards (Univ. of Pennsylvania) for insect physiology and insecticide toxicology, and Dr. R. H. Daggy (U. S. Public Health Service) for economic entomology. A new laboratory was constructed and equipped for inaugurating work in insect physiology. This laboratory is adjacent to the ecology laboratory and shares some of the same facilities. In 1946, Dr. L. L. Smith, Jr. (Minnesota State Conservation Dept.) was brought in, at first on a part time cooperative basis, to handle teaching and research in fisheries; Dr. A. L. Burroughs (Hooper Foundation, Univ. of California) for medical entomology, and Mr. Thor Aamodt, who replaced Prof. Ruggles as State Entomologist with part time faculty status, began teaching an advanced course in Quarantine and Regulatory Entomology. In 1947, Dr. Daggy accepted a position with the Saudi Arabia Oil Company and was replaced with Dr. L. K. Cutkomp (TVA) who took over teaching and research in insecticides, with a new laboratory now being constructed for this purpose; Dr. H. E. Milliron (Bureau of Entomology) was added to handle taxonomy and the insect collection; and with the aid of a grant from the U. S. Public Health Service a new laboratory is now being built for experimental work in medical entomology.

The divisional set-up then stands at present:

Prof. Mickel, Chief, general entomology and taxonomy,
Prof. Granovsky, insect vectors of plant diseases,
Prof. Hodson, ecology, forest entomology, and elementary economic entomology,
Assoc. Prof. Haydak, apiculture,
Assoc. Prof. Marshall, conservation and mammalogy,
Assoc. Prof. Richards, physiology, histology and embryology,
Assoc. Prof. Smith, fish and fisheries,
Asst. Prof. Aamodt, legislative entomology,
Asst. Prof. Burroughs, medical entomology and parasitology,
Asst. Prof. Cutkomp, insecticides, advanced principles of economic entomology,
Asst. Prof. Milliron, taxonomy, elementary economic entomology,

plus various non-permanent teaching and research assistants.

Despite changes in staff and the introduction of some new lines of research, the program and philosophy of entomology at Minnesota remains much as it used to be. Except for a few "service courses," entomology here is still primarily a graduate field of study with emphasis on principles, procedures and a broad background. Undergraduates who major in entomology devote almost all of their time to obtaining a broad general background in basic science plus a curriculum of zoology and elementary entomology. As a rule there is no concentration in entomology until the years of graduate study. Close relationships are maintained with the Zoology Department, with four members of the entomology staff holding titles in the Zoology Department also, and the courses in General Entomology, Insect Physiology, Medical Entomology, Parasitology and Ecology being given under joint sponsorship of the two departments.

Space in the Division is at a premium—all kinds of space. The Division has plans for a new building to take care of this but when it will become available is not known. In the meanwhile entomology continues to rub elbows with the library and administration in one building.

Current Entomological Literature

COMPILED BY EDWIN T. MOUL AND RAYMOND Q. BLISS.

Under the above head it is intended to note papers received at the Academy of Natural Sciences of Philadelphia and the University of Pennsylvania, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

This list gives references of the current or preceding year unless otherwise noted. Continued papers, with few exceptions, are recorded only at their first installment.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

NOTE: The figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the List of periodicals and serials published in our January and June issues. The number of the volume, and in some cases, the part, heft, &c is followed by a colon (:). References to papers containing new forms or names not so stated in titles are followed by (*); if containing keys are followed by (k); papers pertaining exclusively to Neotropical species, and not so indicated in the title, have the symbol (S).

Papers published in ENTOMOLOGICAL NEWS are not listed.

GENERAL—Annand, P. N.—Preventive entomology. [37] 40: 461–68. **Anonymous**—Obituary of the Reverend Father Leopold, O.C.R., D.S.A. [23] 79: 61. **Bentley, G. M.**—Obituary of Franklin Sherman. [37] 40: 610–11. **Berger, L.**—L'Etiquetage des insectes. [Lambillionea, Bruxelles] 45: 5–8. **Carpenter, F. M.**—Early insect life. [73] 54: 65–85. **Coppel and House**—A description of cages used for the large-scale breeding of Sturmia sp., a tachinid parasite of sawflies. [23] 79: 74–80. **Denier, P. C. L.**—Lista de los artropodos dañinos o útiles a los algodonales argentinos. [Physis] 17: 553–67. **Frost, S. W.**—Obituary of Vernon Raymond Haber. [37] 40: 613–14. **Griffiths, J. T.**—A further account of the effects of DDT when used on citrus trees in Fla. [31] 30: 1–8. **Guyton, F. E.**—Bee sting therapy for arthritis and neuritis. [37] 40: 469–72. **Kiriakoff, S.**—L'Espece et ses subdivisions [Lambillionea, Bruxelles]. 45: 43–45, 53–55, 60–63. **Linduska and Morton**—Determining the repellency of solid chemicals to mosquitoes. [37] 40: 562–64. **Nagel and Granovsky**—A turntable light-trap for taking insects over regulated periods. [37] 40: 583–86. **Parks, T. H.**—Obituary of John Samuel Houser. [37] 40: 611–13. **Smith, R. C.**—Is entomology zoology? [37] 40: 608–09. **Snyder and Morton**—Benzyl benzoate-dibutyl phthalate mixture for impregation of clothing. [37] 40: 586–87.

ANATOMY, PHYSIOLOGY, MEDICAL—Bonnemaison, L.—Remarques sur la symbiose chez les Pentatomidae. [108] 51: 40–42. **Burkenroad, M. D.**—Reproductive activities of decapod crustacea. [3] 81: 392–98. **Christensen, J. R.**—Estudios anatómicos tubo digestivo de

algunos insectos argentinos (Orthop.). [Physis] 17: 265–73. **Harnly, M. H.**—Quinine and cinchonine effects on growth, differentiation and lethal temperature of D. melanogaster. [3] 81: 330–39. **Hervey and Schroeder**—Life cycle of Macrosteles divisus in relation to carrot yellows in western New York. [37] 40: 505–08. **Iablokoff, A. K.**—Contribution à l'étude du role du facteur hygrometrique dans l'ecologie et la biologie des insectes xylophages. [108] 52: 88–95, ill. **Judd, W. W.**—The proventriculus of a ground beetle, Chlaenius sp. (Carab.). [23] 79: 58–60. **Kosswig and Shengün**—Intraindividual varibility of chromosome IV of Chironomus. [42] 38: 235–39. **Kozhantshikov, V.**—Nutritional value of proteins in the growth of the blow-fly larva. [Rev. d'Entom. de L'urss] 28: 57–63. **Merrell, D. J.**—A mutant in D. melanogaster affecting fertility and eye color. [3] 81: 399–400. **Miller, R. H.**—The toxicity of the venom of the tarantula (A. cryptethus) upon certain invertebrates and cold-blooded and warm-blooded vertebrates. [39] 39: 45–55. **Mulnard, J.**—Le développement embryonnaire d'Acanthoscelides obtectus. [Arch. de Biol.] 58: 289–314, ill. **Saez, F. A.**—Estado de las investigaciones sobre Citologia de las variedades de Shistocerca paranensis. [Physis] 17: 253–59, ill. **Simmonds, F. J.**—Improvement of the sex-ratio of a parasite by selection. [23] 79: 41–44. **Welsh and Gordon**—The mode of action of certain insecticides on the arthropod nerve axon. [105] 30: 147–71. **Wishart, G.**—Further observations on the changes taking place in the corn borer population in western Ontario. [23] 79: 81–83.

ARACHNIDA AND MYRIOPODA—**Anastos, G.**—Hosts of certain New York ticks. [73] 54: 178–80. **Banks, N.**—On some Acarina from North Carolina. [73] 54: 110–41 (k*). **Bryant, E. B.**—A list of spiders from Mona Island, with descriptions of new and little known species. [73] 54: 86–99.—Notes on spiders from Puerto Rico. *Ibid.* 183–93 (*). **Mello-Leitão, C. de**—Une araignée argentine type d'une sous famille nouvelle (Corinoctenus anomalostomus, n. sp.). [Physis] 17: 137–43, ill.—A propos d'un nouveau Oonopide myrmecophile d'Argentine. *Ibid.* 143–46, ill.—Les Arachnides et la zoogeógraphie de Argentine. [Physis] 17: 601–30. **Miller, R. H.**—(See under Anatomy.) **Thurman and Mulrennan**—Occurrence of the brown dog tick on Florida rats. [37] 40: 566–67.—Sarcoptoid mites on rats in Florida. *Ibid.* 591–92. **Tragardh, I.**—Diarthrophallina, a new group of mesostigmata, found on Passalid beetles. [Entom. Meddelelser, Kopenhavn] 24: 369–94 ill. (k*).

SMALLER ORDERS—Arlé, R.—Quelques Collémboles de l'Etat d'Espirito Santo (Brésil). [Physis] 17: 125–32, ill. (*). **Crawford, J. C.**—The N. A. species of the genus Megalothrips (Thysanoptera). [65] 49: 197–99 (k*). **Carpenter, F. M.**—Taxonomic notes on the Dilaridae (Neuroptera). [73] 54: 100–09 (*). **Denning, D. G.**—New species and records of N. A. Hydroptilidae (Trichoptera). [73] 54: 170–77. **Del Ponte y Riesel**—Notas sobre Siphonaptera argentinos. [Physis] 17: 543–51. **dos Santos, N. D.**—Descrição do alótipo macho de Dasythemis essequiba Ris, 1919 e notas sôbre a fêmea (Odonata). [111] 7: 289–91, ill. (S). **Gurney, A. B.**—Notes on Dilaridae and Berothidae, with special reference to the immature stages of the nearctic genera (Neuroptera). [73] 54: 145–69. **Walker, E. M.**—Further notes on the subarctic Odonata of N. A. [23] 79: 62–67.

ORTHOPTERA—Chagnon, G.—The cockroaches of the Province of Quebec. [23] 79: 57–58 (k). **Christensen, J. R.**—(See under Anatomy.) **Laing, F.**—The cockroach, its life history. [Brit. Mus. Econ. Ser.] 12: 1–28, ill. **Lieberman, J.**—Las Tropidacrini de la Región neotropical (Acrídid). [Physis] 17: 589–600, ill. (k).—Nuevos materiales acridicos de la coleccion del Instituto Oswaldo Cruz, con algunas observaciones sobre Episcopotettix Rehn, 1902. [111] 7: 391–94. **Mello-Leitao, C. de**—Nuevo Listrocelido argentino. [Rev. de la Soc. Ent. Argentina] 13: 147–49, ill. **Rehn, J. A. G.**—A new genus and two new species of neotropical Pseuodophyllinae (Tettigoniidae).. [109] 198: 1–12, ill. **Saez, F. A.**—(See under Anatomy.) **Toledo Piza Junior, S. de**—Phasmidas do Museu Argentino de Sciencias Naturaes. [Physis] 17: 113–16.

HEMIPTERA—Blanchard, E. E.—Estudio sistemático de los Afidoideos argentinos (Aphididae). [Physis] 17: 857–1003, ill. (k*). **Bonnemaison, L.**—(See under Anatomy.) **Barber, H. G.**—Revision of the genus Nysius in the U. S. and Canada (Lygacidae). [48] 37: 354–66, ill. (k*). **Clancy and Pollard**—Further experiments in the parasitization of mealybugs. [37] 40: 578–79. **Drake and Poor**—Some Tingitidae from the Republic of Argentina. [Physis] 17: 95–98, ill. **Fennah, R. G.**—Notes on West Indian Flatidae. [63] 60: 107–17, ill. (S*). **Gonçalves, C. R.**—Biologiá de uma Pseudiastata depredadora de Pseudococcus brevipes (Diastatid). [Physis] 17: 103–12, ill. **Grundemann, A. W.**—Studies on the biology of Triatoma sanguisuga in Kansas (Reduviidae). [43] 20: 77–85. **Hervey and Schroeder**—(See under Anatomy.) **Hill, R. E.**—An un-

usual weather sequence accompanying the severe potato psyllid outbreak of 1938 in Nebraska. [43] 20: 88–92. **Hoberlandt, L.**—A new species of Phymata from South America. [111] 7: 323–26, ill. **Hungerford, H. B.**—A new genus of Corixidae. [43] 20: 93. **Lent and Wygodzinsky**—Contribuição ao conhecimento dos Reduviinae Americanos. [111] 7: 341–68, ill. (k*). **Lizer y Trelles, C.**—Catálogo sistemático razonado de los Cóccidos (Hom. Sternor) vernaculos de la Argentina. [Physis] 17: 157–210. **Mazza y Jörg**—Las nervaduras hemielitrales de los Triatomidae. [Physis] 17: 245–53, ill. **Milliron, H. E.**—(See under Hymenoptera.) **Wygodzinsky, P.**—Sôbre un novo gênero e una nova espécie de Ectrichodiinae do Brasil. [111] 7: 301–05.

LEPIDOPTERA—Beirne, B. P.—The origin and history of the British Macrolepidoptera. [88] 98: 273–72, ill. **Bourquin, F.**—Metamorfosis de Racheospila gerularia (Geometrid). [Physis] 17: 385–98, ill.—Metamorfosis de Cerura annulifera (Notodontid). *Ibid.* 399–408, ill.—Metamorfosis de Plutella maculipennis (Plutellid). *Ibid.* 409–13, ill.—Metamorfosis de Pholisora (Staphylus) similis (Hesperiid). *Ibid.* 415–18, ill.—Metamorfosis de Pilocrocis leucoplagalis (Pyralid). *Ibid.* 419–22, ill.—Metamorfosis de Laphygma frugiperda (Noctuid). *Ibid.* 423–30, ill.—Metamorfosis de Podalia nigricostata (Megalopygid). *Ibid.* 431–41, ill. **Breyer, A.**—Los representantes argentinos de la familia Brassolidae. [Physis] 17: 496–502.—Los representantes argentinos de la familia Morphidae. *Ibid.* 503–508.—Lepidopterilogia argentina. Consideraciones zoogeográficas. *Ibid.* 509–24, map. **Chermock, R. L.**—A new subspecies of Limenitis archippus. [2] 1365: 1–2. **Clarke, J. F. G.**—A new Dichomeris from eastern U. S. (Gelech.). [65] 49: 187–89, ill. **Hayward, K. J.**—Hesperoidea argentina. III. Especies nuevas o poco conocidas de la Fauna argentina. [Physis] 17: 279–301, ill.—Las especies argentinos del genéro Butleria Kirby. Con descripción de dos nuevos por el general W. H. Evans (Hesperiid). *Ibid.* 303–310, ill. (k).—Descripción de una nueva especie de Speocropia Hampson (Acronyctinae). *Ibid.* 311–16.—Contribución al conociemento de las Riodinidae argentinas. *Ibid.* 317–74 (k).—Ropaloceros de las Yungas de Bolivia Coleccionadas en 1931 por P. C. L. Denier. *Ibid.* 374–84. **Kiriakoff, S.**—Position systématique des Lepidoptères et les divisions primaires de l'ordre. [Lambillionea, Bruxelles] 46: 21–26.—Principes generaux et criteres de la classification des Lepidoptères. *Ibid.* 51–64. **Koehler,**

P.—Especies nuevas de Satyridae y complemento a mi Prodromus. [Physis] 17: 443–47.—Contribucion al estudio de los Noctuidae argentinos. *Ibid.* 449–55 (s*).—Notas sobre Psychidae argentinos. *Ibid.* 457–71 (k to chrysalids of Zamopsyche).—Parásitos de Psychidae argentinos. *Ibid.* 474–94, ill. **Lemche, H.**—The longitudinal design in the wing-pattern of Lepidoptera, especially in the fore-wing of Ephestia kühniella (Pyral.). [Entom. meddelelser, Kobenhavn] 24: 305–47, ill.—Some hypotheses concerning the reactions of the wing-pattern of Ephestia kühniella to temperature treatment. *Ibid.* 347–60. **May, Eduardo**—Notes on the lepidopterous fauna of the northern region of the State of Espirito Santo, Brasil. [Physis] 17: 133–36. **Miner, F. D.**—Life history of the diamond-back moth. [37] 40: 581–83. **Munroe, E. G.**—Four new Pieridae from the West Indies. [2] 1362: 1–5. **Stallings and Turner**—Notes on Kansas butterflies with description of a new subspecies. [43] 20: 93–94. **Travassos Filho, L.**—Estudo atual dos generos Methysia Butler, 1876 e Metamya, novo nome para Paramya Druce 1898 (Ctenuchidae). [Papeis Avulsos Dept. Zool. S. Paulo] 7: 257–66. **Travassos, L.**—Contribuição ao conhecimento dos Arctiidae XIII. [111] 7: 335–40, ill. (S). **Vázquez, L.**—Papilios nuevos de Mexico. [8] 18: 249–56, ill. **Wester and St. George**—Life history and control of the webworm Homadaula albizziae. [37] 40: 546–53. **Wishart, G.**—(See under Anatomy.)

DIPTERA—Alexander, C. P.—New nearctic crane-flies. [23] 79: 68–73.—Tipulidae of the southeastern Pacific. [Occasional Papers Bishop Mus.] 18: 337–47, ill. (*). **Bailey, N. S.**—(See under Hymenoptera.) **Bequaert, J. C.**—Catalogue of recent and fossil Nemestrinidae of America north of Mexico. [73] 54: 194–207. **Blanchard, E. E.**—Los Sarcofágidos argentinos. Contibucion a su conocimiento. [Physis] 17: 791–856 (k*). **Borgmeier, T.**—Contribuição para o conhecimento de Megaselia (Aphiochaeta) biseriata (Phorid.). [Physis] 17: 99–102, ill. **Breland, O. P.**—Orthopodomyia alba in Texas with notes on biology (Culicid). [65] 49: 185–87. **Bruch, C.**—Contribución al conocimiento de los tipúlidos argentinos. [Physis] 17: 3–28, ill.—Catologo de los tipúlidos de la República Argentina. *Ibid.* 29–56. **Chagnon, G.**—A dipterous insect new to Quebec, Acrocera stoyskali. [23] 79: 67. **Coppel and House**—(See under General.) **Curran, C. H.**—The Syrphidae of Guadalcanal, with notes on related species. [2] 1364: 1–17 (k*).—New species of Volucella from Hawaii and the U. S. (Syrphidae). *Ibid.* 1–6 (k*).—New and little known American Tachini-

dae. [Bull. Amer. Mus. Nat. Hist.] 89: 45–122, ill. (k*). **Da Costa Lima, A.**—Nova especie do genero Rhysops (Syrphidae). [Bol. da Soc. Brasileira de Agronomia] 9: 155–56, ill.—Uma nova mosca de fruta do genero Cryptodactus (Trypetidae). [Anales Acad. Brasileira de Ciencias] 19: 153–57, ill. **Del Ponte, S.**—Revisión de los Oestridae argentinos. [Physis] 17: 525–34 (S*).—Identificación de Sabethini por medio de tarjetas perforadas. *Ibid.* 535–41, ill. **Fraga G., Alberto**—El género Listriosa de la subfamilia Pangoniinae (Tabanid). [Physis] 17: 149–56, ill. (k). **Harnly, M. H.**—(See under Anatomy.) **Hawbolt, L. S.**—Bessa selecta (Dipt., Tachin) as a parasite of Gilpiria hercyniae (Hym., Diprion). [23] 79: 84–104. **Koehler, P.**—(See under Lepidoptera.) **Kosswig and Shengün**—(See under Anatomy.) **Kozhantshikov, V.**—(See under Anatomy.) **Linduska and Morton**—(See under General.) **Merrell, D. J.**—(See under Anatomy.) **Pritchard, Seabrook and Mulrennan**—The mosquitoes of the Florida Keys. [31] 30: 8–15. **Reinhard, H. J.**—New North Amer. muscoid Diptera. [43] 20: 95–116, ill. **Ross, H. H.**—The mosquitoes of Illinois. [Bull. Ill. Nat. Hist. Survey, Urbana] 24: 1–96, ill. (k). **Rozeboom, L. E.**—Taxonomic notes concerning Phlebotomus osornoi (Psychodid.). [65] 49: 177–82. **Souza Lopes, H. de**—Sobre alguns Sarcophagidae de Misiones (Argentina). [Physis] 17: 117–24.—Sôbre o gênero Notochaeta Aldrich, 1916, com descrições de duas espécies novas do Amazonas. [111] 7: 375–82, ill. **Stuardo, C. O.**—Algunas anotaciones sobre los Nemestrinidae de la República Argentina. [Physis] 17: 77–94. **Ungureanu and Shute**—The value of the wing scales as an aid to the taxonomy of adult Anopheles maculipennis. [69] 16: 79–85, ill. **Walshe, B. M.**—Feeding mechanisms of Chironomus larvae. [53] 160: 474, ill.

COLEOPTERA—Dallas, E. D.—Anomalia simetrica en un Eucranium arachnoides (Scarab). [Physis] 17: 275–78.—Monographia de Calosoma (Castrida) argentinense (Carab.). [Physis] 17: 771–89, ill. (*). **Denier, P. C. L.**—De Coccinellidis Bethesianis. Typorum speciarium Recensio. [Physis] 17: 568–87. **Gressitt, J. L.**—Notes on the Lepturinae. [65] 49: 190–92. **Judd, W. W.**—(See under Anatomy.) **Mulnard, J.**—(See under Anatomy.) **Ogloblin, A. A.**—Un Oedomérido perjudicial a la yerba mate (Copidita argentina). [Physis] 17: 27–44, ill. **Robinson, M.**—Two new species of Scarabaeidae. [83] 73: 169–71. **Gahan and Laing**—Furniture beetles, their life history. [Brit. Mus. Econ. Ser.] 11: 1–26, ill.

HYMENOPTERA—Bailey, N. S.—Trichupria tabanivora in Massachusetts (Diapr.). [73] 54: 142. **Clancy and Pollard**—(See under Hemiptera.) **Doutt and Finney**—Mass-culture technique for Dibrachys cavus. [37] 40: 577 **Guyton, F. E.**—(See under General.) **Hawbolt, L. S.**—(See under Diptera.) **Koehler, P.**—(See under Lepidoptera.) **MacDonagh, E. J.**—Las hormigas Attinae de Patagones y rectificación de la supuesta Oecodoma de Hudson. [Physis] 17: 211–16, ill. **Milliron, H. E.**—A new aphelinid egg parasite of the Saratoga spittlebug, A. saratogensis. [65] 49: 193–97, ill. (k). **Ogloblin, A. A.**—Descripción de un género nuevo de la familia Mymaridae. [Physis] 17: 17–26, ill.—Descripciones de Bethylidae y Dryinidae de las Colecciones del Museo Argentino de Ciencias naturales. [Anales Musco Argentino de Cien.] 50: 33–48, ill. (k*). **Pate, V. S. L.**—A revision of the genus Arigorytes (Sphecid). [23] 79: 51–56 (k*). **Simmonds, F. J.**—(See under Anatomy.) **Viana, M. J.**—Notas sobre la biologia de Parapechthis bazani Blanchard. [Physis] 17: 261–64. **Walley, G. S.**—The genus Casinaria Holmgren in America n. of Mexico (Ichneumonidae). [Sci. Agriculture] 27: 364–95, ill. (k*). **Williams, F. X.**—Aculeate wasps of Fiji. [Occasional Papers of Bishop Mus.] 18: 317–36 (*).

Reviews

INSECTS AND HUMAN WELFARE. An account of the more important relations of insects to the health of man, to agriculture, and to forestry. By Charles T. Brues. Harvard University Press, Cambridge, Massachusetts, revised edition, 1947. Pp. xiii + 154, 14 figures. Price, $2.50.

The five chapters of this book deal with the relation of insects to public health and in relation to the food supply, with forest insects and with household insects and with a brief account of the outlook for the future. Considering the modest size of the volume, the amount of information included is really amazing. Dr. Brues writes in such a readable style and uses such disarmingly straightforward and completely non-technical language that the average reader will probably never realize the great amount of careful preparation that must have gone into this book, or how comprehensive it is, how scientifically accurate and up-to-the-minute.—R. G. SCHMIEDER.

SEXUAL BEHAVIOR IN THE HUMAN MALE. By Alfred C. Kinsey, Wardell B. Pomeroy, and Clyde E. Martin. W. B. Saunders, Philadelphia and London, 1948. Pp. xv + 787. Price, $6.50.

It is the author's name rather than the subject that brings this notice into ENTOMOLOGICAL NEWS. Entomologists that are familiar with the work of Professor Kinsey of Indiana University on gall-wasps will doubtless be astonished at the subject-matter of his latest publication but they will not, however, be unprepared to find that he has done an exceedingly good job. Indeed, Professor Kinsey's long preoccupation with the rigorous procedures he followed in his population studies in the genus Cynips probably provided a better training than would an equal amount of time as a sociologist. The study of human behavior patterns, often complexly combined in single individuals and varying from individual to individual and varying also at different social levels presents problems very different from but in many ways analagous to the study of variation in a group of morphological characters in an insect species in different parts of its range.

From 1920 to 1938, Dr. Kinsey had published well over 1000 pages on the gall-wasps, including his monograph on Cynips (1930) in which he traced the phylogeny of the various eastern species through chains of species spreading from the southwest. Later, in "Origin of Higher Categories in Cynips" (1936) he traced the origins of these down through Mexico and Guatamala and found that practically all forms were brought together in two or three continuous chains. From these studies he developed the idea of an infrequently dividing chain of existing species rather than the traditional evolutionary "tree." The higher categories are then sections of the chain rather than groups of twigs whose parent branches are hypothetical and extinct. Kinsey's conclusions were built up on a foundation of a thorough and exacting study of individual variation over the entire range of each species.

The present book is "a fact-finding survey in which an attempt is being made to discover what people do sexually and what factors account for differences in behavior among individuals and among various segments of the population." In it Dr. Kinsey's thoroughness and method are again evident. The data are based on 5300 individual histories and are presented in the form of 173 graphs, 151 tables, 48 pages of clinical tables and 27 pages of tables and computations on sample size. The work was supported by the Rockefeller Foundation and by Indiana University. Without doubt the book will arouse much comment both pro and con; its subject matter has never before been dealt with in such a comprehensive way and people will have to get used to being better informed.—R. G. SCHMIEDER.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

Chrysididae—Wanted for determination in preparation of revision. Wm. G. Bodenstein, Galesville, Maryland.

Wanted—Ataenius and allied Aphodiinae from all parts of the world, especially Mexico, Central and South America. O. L. Cartwright, Clemson, S. C.

Wanted—Reprints and unpublished mss. on biological control of mosquitoes; for preparing annotated bibliographies for publication. J. B. Gerberich, Michigan State College, East Lansing, Mich.

Wanted—Hesperid genus Megathymus for exchange or purchase. P. S. Remington, 5570 Etzel Ave., St. Louis 12, Missouri.

Wanted—Psychodidae of North America for revisional purposes. Wm. F. Rapp, Jr., 203 Harker Hall, Urbana, Ill.

Diptera—Tachinidae-Dexiidae wanted, No. Amer. and exotic. Will collect most orders in exchange or will purchase. P. H. Arnaud, 60 Woodrow St., Redwood City, Calif.

Will collect—Zoological and entomological specimens in tropical and subtropical parts of Peru. Jose M. Schunke, Pucallpa, Peru.

Wanted—Diplotaxis; will buy or exchange. E. W. Mange, 307 W. Walnut St., Hanover, Pa.

Hymenoptera-Aculeata (except ants and bees) for exchange. Will collect other orders in exchange. N. F. de Andrade, Casal Novo, S. João do Estoril, Portugal.

Meliponidae—Wanted, information on the bionomics, culture, and economic importance of the stingless bees, particularly of the Old World. P. Nogueira Neto, Av Cicade Jardim 170, S. Paulo, Brasil.

Wasps (Vespoidea, Sphecoidea, Chrysidoidea) of the world by exchange or purchase. Will collect other orders in exchange. D. G. Shappirio, 4811 17th St., N.W., Washington 11, D. C.

Lepidoptera—Large quantities of Plexippus, Colias, Cardui, Vanillae wanted for cash or exchange for tropical butterflies. G. MacBean, 710 Miller Rd., Sea Island, Vancouver, B. C.

Ants of the tribe Dacetini (*Strumigenys, Rhopalothrix* and related genera) wanted for world revision. W. L. Brown, Jr., Harvard University Biological Laboratories, Cambridge 38, Mass.

Mallophaga (on which immediate determination is not necessary) wanted for study and determination. R. L. Edwards, Dept. Biology, Harvard University, Cambridge 38, Mass.

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